

WHAT IS CLAIMED IS:

1 1. A current supply system, comprising:

2 a plurality of current supply modules, wherein each current supply module includes
3 an input terminal and an output terminal and each current supply module has a maximum
4 output power, and wherein multiple current supply modules are electrically combined to
5 form a current supply unit having a maximum output power that is greater than the
6 maximum output power of the individual current supply modules;

7 a control unit connected to the current supply unit; and

8 a data connection for connecting the control unit to all the current supply modules of
9 the current supply unit.

1 2. The current supply system of claim 1, wherein the current supply system is a plasma
2 plant current supply system.

1 3. The current supply system of claim 1, wherein the current supply modules are power
2 converters.

1 4. The current supply system of claim 1, wherein the maximum output power of all the
2 current supply modules is substantially the same.

1 5. The current supply system of claim 1, wherein a plurality of first current supply systems
2 are electrically combined to form a first current supply unit having a first maximum
3 power output and a plurality of second current supply systems are electrically combined
4 to form a second current supply unit having a second maximum power output different
5 from the first maximum power output.

1 6. The current supply system of claim 1, wherein each current supply module includes a
2 receptacle for receiving the control unit, and wherein exactly one current supply module
3 of each current supply unit receives the control unit.

1 7. The current supply system of claim 6, wherein the current supply module that receives
2 the control unit is adapted for connection to an external controller.

- 1 8. The current supply system of claim 7, wherein the external controller is a computer.
- 1 9. The current supply system of claim 6, wherein the control unit is adapted for connection
2 to an external controller.
- 1 10. The current supply system of claim 9, wherein the external controller is a computer.
- 1 11. The current supply system of claim 1, wherein each current supply module includes a
2 measuring device for measuring a current supply module output quantity.
- 1 12. The current supply system of claim 11, wherein the output quantity is selected from the
2 group consisting of a voltage, a current, and a power.
- 1 13. The current supply system of claim 11, wherein each measuring device includes a signal
2 matching circuit for converting a voltage, a voltage/current converter for converting the
3 output voltage of the signal matching circuit into a current, and an apparent ohmic
4 resistance for generating a voltage drop.
- 1 14. The current supply system of claim 11, wherein the measuring signals of the current
2 supply modules are supplied to the current supply unit of the control unit in parallel via
3 the data connection.
- 1 15. The current supply system of claim 1, wherein the current supply system is disposed in a
2 switching cabinet.
- 1 16. The current supply system of claim 1, wherein the current supply modules are current
2 sources.
- 1 17. The current supply system of claim 1, further comprising an interlock circuit for the
2 current supply unit, wherein the interlock circuit is adapted for connection to the current
3 supply modules of the current supply unit.

1 18. The current supply system of claim 1, further comprising:

2 a common input electrical conductor for electrically connecting the current supply
3 modules of the current supply unit at the output side; and

4 a common output electrical connector that electrically connects the output terminals
5 of two neighboring current supply modules.

1 19. The current supply system of claim 18, wherein two or more current supply modules of
2 the current supply unit are electrically connected at the input side.

1 20. The current supply system of claim 19, wherein all the current supply modules are
2 electrically connected at the input side.

1 21. The current supply system of claim 18, wherein the common input electrical conductor is
2 identical to the common output electrical conductor.

1 22. The current supply system of claim 18, wherein the input terminal includes a plurality of
2 connectors that correspond to a number of phases of a power line connection, and the
3 output terminal includes two connectors, which are disposed in different conductor
4 planes, and through which the conductors may be connected to corresponding connectors
5 of neighboring current supply modules.

1 23. The current supply system of claim 18, further comprising insulative distribution
2 elements for connecting the conductors with the terminals, wherein the distribution
3 elements each comprise receptacles for receiving ends of the conductors.

1 24. A plasma plant current supply system, comprising:

2 a plurality of substantially similar power converter modules, wherein each power
3 converter module includes an input terminal and an output terminal, and each power
4 converter module has a maximum output power that is substantially similar to the
5 maximum output power of other power converter modules, and wherein multiple power
6 converter modules are combined to form a current supply unit having a maximum output

7 power that is greater than the maximum output power of the individual power converter
8 modules;

9 a control unit connected to the current supply unit;

10 a data connection for connecting the control unit to all the power converter modules
11 of the current supply unit;

12 a common input electrical conductor for electrically connecting the current power
13 converter modules of the current supply unit at the output side; and

14 a common output electrical connector that electrically connects the output terminals
15 of two neighboring power converter modules.

1 25. The current supply system of claim 24, wherein a plurality of first current supply systems
2 are electrically combined to form a first current supply unit having a first maximum
3 power output and a plurality of second current supply systems are electrically combined
4 to form a second current supply unit having a second maximum power output different
5 from the first maximum power output.

1 26. The current supply system of claim 24, wherein each current supply module includes a
2 receptacle for receiving the control unit, and wherein exactly one current supply module
3 of each current supply unit receives the control unit.

1 27. The current supply system of claim 26, wherein the current supply module that receives
2 the control unit is adapted for connection to an external controller.

1 28. The current supply system of claim 27, wherein the external controller is a computer.

1 29. The current supply system of claim 26, wherein the control unit is adapted for connection
2 to an external controller.

1 30. The current supply system of claim 29, wherein the external controller is a computer.

1 31. The current supply system of claim 24, wherein each current supply module includes a
2 measuring device for measuring a current supply module output quantity.

1 32. The current supply system of claim 31, wherein the output quantity is selected from the
2 group consisting of a voltage, a current, and a power.

1 33. The current supply system of claim 31, wherein each measuring device includes a signal
2 matching circuit for converting a voltage, a voltage/current converter for converting the
3 output voltage of the signal matching circuit into a current, and an apparent ohmic
4 resistance for generating a voltage drop.

1 34. The current supply system of claim 31, wherein the measuring signals of the current
2 supply modules are supplied to the current supply unit of the control unit in parallel via
3 the data connection.

1 35. The current supply system of claim 24, wherein the current supply system is disposed in
2 a switching cabinet.

1 36. The current supply system of claim 24, further comprising an interlock circuit for the
2 current supply unit, wherein the interlock circuit is adapted for connection to the current
3 supply modules of the current supply unit.

1 37. The current supply system of claim 24, wherein two or more current supply modules of
2 the current supply unit are electrically connected at the input side.

1 38. The current supply system of claim 37, wherein all the current supply modules are
2 electrically connected at the input side.

1 39. The current supply system of claim 24, wherein the common input electrical conductor is
2 identical to the common output electrical conductor.

1 40. The current supply system of claim 24, wherein the input terminal includes a plurality of
2 connectors that correspond to a number of phases of a power line connection, and the
3 output terminal includes two connectors, which are disposed in different conductor

4 planes, and through which the conductors may be connected to corresponding connectors
5 of neighboring current supply modules.

1 41. The current supply system of claim 24, further comprising insulative distribution
2 elements for connecting the conductors with the terminals, wherein the distribution
3 elements each comprise receptacles for receiving ends of the conductors.

1 42. A method of providing an electrical current, the method comprising:
2 providing a plurality of current supply modules, wherein each current supply module
3 includes an input terminal and an output terminal and each current supply module has a
4 maximum output power;
5 establishing an electrical connection between multiple current supply modules to
6 form a current supply unit having a maximum output power that is greater than the
7 maximum output power of the individual current supply modules;
8 controlling the current supply unit with a control unit; and
9 controlling the current supplied by each current supply module through a data
10 connection that connects the control unit to all the current supply modules of the current
11 supply unit.

1 43. The method of claim 42, further comprising:
2 establishing an electrical connection between multiple first current supply modules to
3 form a first current supply unit having a first maximum power output; and
4 establishing an electrical connection between multiple second current supply modules
5 to form a second current supply unit having a second maximum power output different
6 from the first maximum power output.